Lecture No. 11.—Optical Meteorology.
Reflection; refraction; dispersion; diffraction; absorption.
Transparency of air.
Mirage; halos; parhelia; Krakatoa; rainbows; coronæ.
Atmospheric electricity; lightning; lightning rods; aurora.
Sunspots; St. Elmo's fire.
In connection with this lecture I give an illustrated review, showing slides upon the following subjects:
Barometer; rain gage; sunshine recorder; anemometer; anemoscope; clouds; halos; fog; barometer charts, etc.
Lecture No. 12.—General circulation of atmosphere.
Explanation; causes; difference in temperature; rotation of earth; explanation of low pressure at poles and tropical high pressure belt; relation of pressure and air movements; vertical currents; surface currents; trade winds; monsoons; calm belts or areas; the typical local circulation over the United States.
Lecture No. 13.—Secondary air circulation.
Cyclones and anticyclones:
Description; classes; distribution of pressure, temperature, wind, and weather in cyclones and anticyclones.
Effect of earth's rotation.
Laws of storms; tropical cyclone; extratropical cyclones; hurricanes.
The theory of cyclones and anticyclones:
Ideal systems; condensation theory; tangling or eddy theory; wave theory.
Lecture No. 14.—Local winds, tornadoes, etc.
Thunderstorms: Classes; cause; time of day; relation to cyclones; movement; mountain thunderstorms; thunder squall; derecho; hail; lightning; theory of formation; tornadoes and spouts; air circulation; how formed; movement; vortex; funnel cloud; waterspouts.
Lecture No. 15.—Illustrated review.
Cyclones and anticyclones and their movement.
Pressure, temperature and wind charts for the globe and correlations.
Ocean currents.
Thunderstorms; ideal air circulation; lightning flashes.
Tornadoes; relation to cyclonic areas; damage.
Lecture No. 16.—Weather.
Elements; weather of different zones; in United States; summer and winter; cyclonic and anticyclonic control.
Local signs and prognostications.
Weather predictions; how distributed.
Lecture No. 17.—Climate.
Weather versus climate.
Most important factors in climate.
Continental; oceanic; of different zones; of different continents.
Lecture No. 18.—Climate of United States.
Main types; pressure; wind; temperatures.
Lecture No. 19.—Climate of United States.
Rainfall; snowfall; humidity; clouds; sunshine.
Climate of Ohio; temperature; wind; rain; snow.
Lecture No. 20.—Examination.
In the above course Waldo's Elementary Meteorology was used as the text-book. If I were giving 40 lectures instead of 20, I should use Davis' Elementary Meteorology.
The daily weather maps are consulted at each session, the principles of weather forecasting explained, and the different weather conditions correlated with the conditions shown on the maps. Instruction is also given in drawing isobars, isotherms, and in shading precipitation areas, part of an occasional hour being given up to this. At least one lecture is given at the local Weather Bureau office, where the instruments and all the work of the office is explained. The daily journals of the students are examined and criticised several times.

Mr. Charles Stewart, Observer, Spokane Wash., addressed the pupils of the Spokane High School on March 21, 1902, on Weather Changes and their Causes. The physical geography class of this school visited the Weather Bureau office at Spokane on April 21 and 22. The station instruments and some phases of Weather Bureau work were explained by Mr. Stewart.

Mr. A. H. Sullivan, Observer in charge, Grand Junction, Colo., reports that a class of young ladies and gentlemen from the High School visited the Weather Bureau office and received a lecture on meteorology from the observer in charge.

Mr. L. M. Tarr, Observer, New Haven, Conn., delivered a course of sixteen lectures to a class of thirteen at Yale University, during the college year, 1901–2. The following subjects were considered: A short history of meteorology; the height, composition, pressure, temperature, and moisture of the atmosphere; evaporation, condensation, and precipitation; general circulation of the atmosphere; development and movement of storms; electrical and optical phenomena; description of instruments; laboratory work at the Weather Bureau office.

Mr. Tarr has been appointed lecturer in meteorology at Yale University, and in return the privileges of the University have been extended to him. His course has been enlarged and will hereafter consist of two hours per week during the second half of the college year.

Mr. N. R. Taylor, Observer, Tampa, Fla., reports a lecture given on May 8, by request of the faculty of Mallicoat, Tampa Preparatory School.

Mr. John R. Weeks, Observer, Macon, Ga., reports that the faculty of Mercer University in that city is considering the advisability of adding meteorology and advanced physical geography to its curriculum. By permission of the Chief of Bureau, it is probable that Mr. Weeks will have charge of instruction in these branches and the time required in attendance at the University will be about two hours per week. It is gratifying to note this evidence of the increased interest being taken in this subject in this part of Georgia. Mr. Weeks also reports an informal address on The Relations of the Weather and the Weather Bureau to the Fruit Industry, delivered at the meetings of the Georgia Fruit Growers Association, March 5 and 14, 1902, and March 25, 1903.

Mr. W. M. Wilson, Section Director, Milwaukee, Wis., reports an address delivered by him at Oconomowoc, March 18 and 20, 1902, before the Wisconsin Farmers' Institute, which has been published in the Bulletin No. 16 of that institute, and from which we take the following extract:

Previous to 1870 few people in the United States conceded the possibility of foreseeing the weather, even twenty-four hours in advance, with any greater certainty than that attained by the wisdom of the "oldest inhabitant," but during that year the public was awakened to the fact that the United States Government had established a department for this very purpose, and began dimly to comprehend that it was not only possible to predict the weather with a certain degree of accuracy, but that it could be done with very great benefit to the commercial and agricultural interests of the country. Since that time familiarity with daily accounts of the verification of the prediction of storms, cold waves, etc., has resulted in the public thought far outstripping the actual advance of the science in this respect, and the country now demands a forecast for a season or a year in advance, where it once considered it a wonderful achievement to predict the weather for twenty-four hours.

In pressing this demand it is said that after thirty years of observation and experience the Weather Bureau should be able to furnish a fairly accurate forecast for more than one or two days, and in truth it should, but let me say that we have not been negligent nor indifferent to this demand. We have attacked this problem of long-range forecasts from every conceivable standpoint, vigorously, and at short range. We have carried our instruments to the highest mountain peaks on the continent; we have taken our lives in our hands and explored the upper atmosphere by means of balloons; we have placed meteorographs in kites and sent them up to the distance of a mile in the hope of finding something in the upper strata that would lead to a solution of the problem; we have studied the influence of the moon and the planets and experimented with electricity and magnetism, but thus far we have found nothing to lead us to believe that there is a possibility at the present time of making even a useful, not to say accurate, forecast of the weather for a period much above forty-eight hours. I am aware that there are men in this country * * * who claim to be able to make accurate predictions of the weather for a year in advance of their fulfilment, but so far as we are able to learn, their theories, which are usually based upon the very questionable influence of planetary and stellar bodies have not commended themselves to a single reputable scientist. In this connection I am constrained to say that a foreknowledge of the weather for a month or a year in advance is not in the possession of any living man at the present time.

[The difficulties will undoubtedly be overcome eventually. We need not be discouraged by our slow progress, and we need not have recourse to false methods. Man is here to conquer nature. The attempt to do so strengthens and develops him. Every year witnesses some new conquest, and there is as yet no sign of our having reached our limit.—*C. A.*]

MISS ALICIA DE RIEMER.

The announcement of the sudden death, on April 8, at Milwaukee, of Miss Alicia De Riemer came as a great shock to

the Editor and all of her friends. A few weeks before, she had been enjoying perfect health and pushing forward her course of instruction in physical geography and meteorology at the State Normal School, Stevens Point, Wis.

Miss De Riemer was born in 1873, in India, of American parents, who were then educational missionaries in Ceylon, but who now reside in Washington, D. C. She had for many years devoted herself to school work, and especially to teaching meteorology, climatology, and physical geography by most original and admirable methods. During the summer of 1898 she devoted herself to work at the Weather Bureau in special lines of investigation, and, among other things, compiled the article on "The average frequency of days of hail during the years 1893–1897," published in the MONTHLY WEATHER REVIEW for December, 1898. She also prepared a popular Primer of Meteorology for the use of such schools as follow modern methods of nature study. This work has, we understand, been published for the use of teachers in Wisconsin. An impressive memorial service was held in Washington, D. C., where she is buried, and one, also, at Stevens Point, Wis. In her death meteorology has lost a most enthusiastic student and teacher.—*C. A.*

CORRIGENDA.

MONTHLY WEATHER REVIEW, February, 1903, page 78, column 1, line 14, for "36" read "38." Page 80, column 2, description of fig. 26, for "mile" read "meter" in both cases. Page 81, fig. 27, column 1, transpose the text but *not* the numbers belonging to figs. I and II. Also, for "in cyclones and the" read "in cyclones and in the."

March, 1903, page 135, in table of mean temperatures, W. R. Castle, omit 78.0° and 55.0°, as these are the absolute extremes, not the mean values.

THE WEATHER OF THE MONTH.

By W. B. STOCKMAN, Forecast Official, in charge of Division of Meteorological Records.

CHARACTERISTICS OF THE WEATHER FOR APRIL.

The temperature was above the normal 1.5° to 2.0° in New England, the Middle Atlantic States, Lake region, and North Dakota, and 0.6° above in the upper Mississippi and Missouri valleys; elsewhere it was below normal, the greatest minus departures occurring in the Florida Peninsula, Gulf States, the middle and northern Plateau, and the north Pacific districts.

The precipitation was slightly above the normal in New England, the upper Lake region, upper Mississippi Valley, and the southern and middle Plateau and south Pacific districts, and considerably above in the lower Lake region; elsewhere it was below the normal, the most marked departures occurring in the Florida Peninsula, Gulf States and the north and middle Pacific districts.

The relative humidity was normal in the Middle Atlantic States, upper Mississippi Valley, the southern slope, and north Pacific district. It was slightly below the normal in New England, the Florida Peninsula, South Atlantic and west Gulf States, upper Lake region, North Dakota, the Missouri Valley, and middle Pacific district; in the remaining districts it was above the normal.

The cloudiness was normal in the south Pacific district; above the normal in the Middle and South Atlantic States, Ohio Valley and Tennessee, upper Lake region, upper Mississippi Valley, the southern slope, southern Plateau, and north Pacific district; elsewhere it was below the average.

PRESSURE.

The distribution of mean atmospheric pressure is graphically shown on Chart IV and the average values and departures from normal are shown in Tables I and VI.

The pressure was highest along the Pacific coast, with secondary high areas of somewhat lower pressure over the Lake Superior region, and along the middle and east Gulf coast.s It was lowest over the southern Plateau region. The pressure was slightly above the normal from southeastern Wyoming southeastward to the Louisiana coast, and southward to the middle Rio Grande Valley; also over the western parts of the middle and northern Plateau regions and in the north and middle Pacific districts; elsewhere it was below the normal, with marked departures east of the Mississippi River, the greatest minus departures occurring over eastern Ohio, southwestern New York, the Middle Atlantic States, the Virginias, and north-central North Carolina.

The pressure increased over that of March, 1903, in the middle and north Pacific regions, and the western parts of the northern and middle Plateau districts, the greatest plus changes occurring along the coasts of northwestern California, and Oregon; elsewhere the pressure diminished from that of March, with quite marked changes east of the one hundred and tenth meridian, the greatest minus changes occurring over the northeastern portion of the country.

TEMPERATURE OF THE AIR.

The distribution of maximum, minimum, and average surface temperatures is graphically shown by the lines on Chart VI.

The temperature was above normal in the Atlantic States north of northeastern North Carolina, in the region from eastern Montana, central South Dakota, and western Nebraska eastward to the Atlantic Ocean, and in the eastern part of Colorado, the extreme western part of Texas, and New Mexico, with the greatest plus departures in Michigan, southeastern Wisconsin, northern Minnesota, and parts of South Dakota; elsewhere the temperature was below normal, with decided minus departures in the States from Kentucky southward to northern Florida, and from east-central California and northwestern Arizona northward to Canadian Territory.

Maximum temperatures of 90° or higher occurred in a small area overlying the northern parts of Virginia, Maryland, Delaware, and southeastern New Jersey, and in central Oklahoma, central Texas, extreme southeastern California, and western and south-central Arizona. A maximum of 103° was reported from southeastern California. Minimum temperatures of 32° or lower were reported from all States except Florida.

The average temperatures for the several geographic districts and the departures from the normal values are shown in the following table:

Average temperatures and departures from normal.

Districts.	Number of stations.	Average temperatures for the current month.	Departures for the current month.	Accumulated departures since January 1.	Average departures since January 1.
		°	°	°	°
New England	8	44.8	+ 1.8	+13.5	+ 3.4
Middle Atlantic	12	52.5	+ 1.9	+13.4	+ 3.4
South Atlantic	10	60.3	— 1.1	+ 5.9	+ 1.5
Florida Peninsula*	8	68.7	— 1.9	+ 5.9	+ 1.5
East Gulf	9	63.6	— 2.4	— 2.1	— 0.5
West Gulf	7	65.4	— 1.7	— 2.4	— 0.6
Ohio Valley and Tennessee	11	55.0	— 1.1	+ 5.3	+ 1.3
Lower Lake	8	46.2	+ 1.5	+12.1	+ 3.0
Upper Lake	10	42.2	+ 2.0	+14.3	+ 3.6
North Dakota*	8	43.9	+ 2.0	+ 6.3	+ 1.6
Upper Mississippi Valley	11	51.7	+ 0.6	+ 9.1	+ 2.3
Missouri Valley	11	51.5	+ 0.6	+ 6.0	+ 1.5
Northern Slope	7	44.4	— 0.2	+ 2.4	+ 0.6
Middle Slope	6	53.8	— 0.4	— 0.4	— 0.1
Southern Slope*	6	60.6	— 0.5	— 3.4	— 0.8
Southern Plateau*	13	54.9	— 1.3	— 5.7	— 1.4
Middle Plateau*	8	45.6	— 2.1	—14.5	— 3.6
Northern Plateau*	12	44.9	— 2.1	+ 0.9	+ 0.2
North Pacific	7	46.8	— 1.9	— 1.1	— 0.3
Middle Pacific	5	53.1	— 1.4	— 5.7	— 1.4
South Pacific	4	57.4	— 1.3	— 2.5	— 0.6

*Regular Weather Bureau and selected voluntary stations.